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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,509	11/28/2001	Gentaro Ishihara	10830-079001 / A36-137192	2324
26211	7590	10/24/2003	EXAMINER	
FISH & RICHARDSON P.C. 45 ROCKEFELLER PLAZA, SUITE 2800 NEW YORK, NY 10111				
			ART UNIT	PAPER NUMBER

3663

DATE MAILED: 10/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/996,509

Applicant(s)

ISHIHARA ET AL.

Examiner

Deandra M Hughes

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-11 is/are rejected.
- 7) ☒ Claim(s) 6 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 25 July 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

### DETAILED ACTION

1. Since the Examiner found the applicant's arguments (paper #10 dated 7/25/03) convincing, the rejections of the previous office action (paper #8 dated 4/25/03) are withdrawn.

### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-2 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Unexamined Patent Application Publication H5-133841 published 28 May 1993 (hereinafter referred to as Shigematsu) in view of Agrawal (Fiber-Optic Communications Systems, 1997).

With regard to claim 1, Shigematsu discloses:

- an optical spectrum analyzing section (10) for preparing optical spectrum information of signal light from a light source (¶ 0017; 'the spectrum of the signal light power *inputted* into the fiber optical amplifier 4 is detected by the optical spectrum analyzer 10' italics mine);
- a noise figure calculating section (computation unit 10) for calculating, based on the optical spectrum information, a noise figure generated by an optical amplifier, the optical amplifier for amplifying the signal light generated from the light source;
- the optical amplifier preparing an amplified light with the noise figure (4);

- wherein the optical spectrum analyzing section prepares the optical spectrum information of the signal light from the light source and optical spectrum information of the amplified signal light (¶ 0020).

Shigematsu does not specifically disclose that the amplifier amplifies the light *at an appointed gain ratio*. However, it is well known in the art to amplify light at an appointed gain ratio. Further, Agrawal teaches this well known concept via the gain ratio (8.1.4) and the principles of fiber-optic communication system design (pgs. 361-367). It would have been obvious to one of ordinary skill in the art at the time the invention was made to amplify the input light signal at an appointed gain ratio for the advantage of compensating for distribution losses (pg. 367).

With regard to claim 2, the noise figure calculating device multiplies the optical spectrum information of the input light source by a coefficient (the Examiner considers the gain,  $G$ , to be the coefficient (line 3 of ¶ 0020) and subtracts the multiplied optical spectrum information from the optical spectrum information of the amplified light ( $P_{\text{sout}}$  of line 3 of ¶ 0020).

Claims 7-8 are merely the normal operations of the apparatus as claimed in claims 1-2.

4. Claims 3-4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Unexamined Patent Application Publication H5-133841 published 28 May 1993 (hereinafter referred to as Shigematsu) in view of Agrawal (Fiber-Optic Communications Systems, 1997) as applied to claims 1-2 and 7-8, respectively above, and further in view of Hentschel (US 5,696,707 published Dec. 9, 1997).

With regard to claims 3-4, Shigematsu in view of Agrawal does not specifically disclose that the noise figure calculating section performs spline interpolation by selecting data of a predetermined number of points. However, Hentschel discloses this method (fig. 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the spline interpretation method of Hentschel for the advantage of improved accuracy of the noise figure estimation (col. 5, line 10).

Claims 9-10 are merely the normal operations of the apparatus as claimed in claims 1-2.

5. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Unexamined Patent Application Publication H5-133841 published 28 May 1993 (hereinafter referred to as Shigematsu) in view of Agrawal (Fiber-Optic Communications Systems, 1997) and Hentschel (US 5,696,707 published Dec. 9, 1997) as applied to claims 3 and 9 above, and further in view of Lerkvarnyu (Moving Average..., 1998). Shigematsu in view of Agrawal and Hentschel does not specifically disclose removing noise via the moving average process. However, this is a well-known signal processing method by which noise is removed. Lerkvarnyu teaches this method (entire article). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a method that does not need prior data (abstract).

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***Allowable Subject Matter***

6. Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter. The prior art does not teach or make obvious detecting the "number of composing signal lights and wavelengths" in preparing the optical spectrum information of claims 1 and 7, respectively.

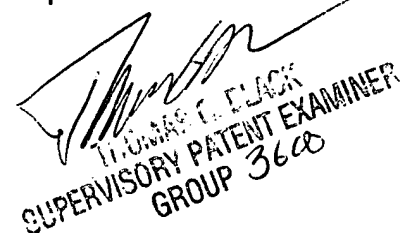
***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mori ('781), Sakuri. Ono, Baney, Boertjes, Goto, Hentschel ('117), Antoniadis, and Mori ('318) teaches noise figure measurement of optical amplifiers.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M Hughes whose telephone number is 703-306-4175. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Black can be reached on 703-305-9707. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.



THOMAS G. BLACK  
SUPERVISORY PATENT EXAMINER  
GROUP 3660